

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

COVER CROP

(acre)

CODE 340

DEFINITION

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and conservation purposes.

seeding rates, seeding dates, seeding depths, and planting methods will be consistent with approved local criteria and site conditions.

The species selected will be compatible with the nutrient management and pest management provisions of the plan.

PURPOSES

- ◆ Reduce erosion from wind and water
- ◆ Increase soil organic matter
- ◆ Manage excess nutrients in the soil profile
- ◆ Promote biological nitrogen fixation
- ◆ Increase biodiversity
- ◆ Weed suppression
- ◆ Provide supplemental forage
- ◆ Soil moisture management

All plant nutrients will be applied in accordance with Nutrient Management, Code 590.

Residue management and conventional planting systems may be used.

Where aerial seeding is done, the cover crop will be planted prior to leaf drop of the preceding crop.

Approved species, seeding rates, and seeding dates are listed in **Tables 1, 2, 3, and 4**.

CONDITIONS WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection

Cover crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop.

Cover crop residue will not be burned.

CRITERIA

General Criteria Applicable To All Purposes

Plant species, seedbed preparation,

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

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Additional Criteria to Reduce Erosion From Wind and Water

Cover crop establishment, in conjunction with other practices, will be timed so that the soil will be adequately protected during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection.

The amount of surface and/or canopy cover needed from the cover crop shall be determined using current erosion prediction technology.

Additional Criteria to Promote Biological Nitrogen Fixation

The specific Rhizobia bacteria will either be present in the soil or the seed will be inoculated at the time of planting legumes.

Nitrogen credits from legume cover crops will be accounted for in the nutrient management plan.

Additional Criteria to Manage Excess Nutrients in the Soil Profile

Cover crops will be established and actively growing before expected periods of high precipitation that can cause leaching.

Cover crop species will be selected for their ability to absorb large amounts of nutrients from the rooting profile of the soil.

The aboveground biomass will be removed from the field for maximum nutrient removal efficiency.

Additional Criteria to Increase Soil Organic Matter

Cover crop species will be selected on the basis of producing high volumes of organic material to maintain or improve soil organic matter.

The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required.

The cover crop will be terminated as late as feasible to maximize plant biomass and still prepare for the subsequent crop.

Additional Criteria to Increase Biodiversity

Cover crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

Species for the cover crop will be selected for their chemical or physical competition with weeds.

Cover crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

Species selected will have desired forage traits, be palatable to livestock,

and not interfere with the production of the subsequent crop.

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

Additional Criteria for Soil Moisture Management

Terminate growth of the cover crop sufficiently early to conserve soil moisture for the subsequent crop.

Cover crops established for moisture conservation shall be left on the soil surface until the subsequent crop is planted.

In areas of potential excess soil moisture, allow the cover crop to grow as long as possible to optimize soil moisture removal.

CONSIDERATIONS

The cover crop should be terminated as late as feasible to maximize plant growth and still prepare the seedbed for the subsequent crop.

Deep-rooted species provide maximum nutrient recovery.

Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Avoid cover crop species that attract potentially damaging insects.

Acceptable benefits, for most purposes, are usually accomplished when the plant density is at least 25 stems per feet, the combined canopy and surface cover is at least 60 percent, and the above ground (dry weight) biomass production is at least 2700 lb/acre.

Cover crops may be used to improve site conditions for establishment of perennial species.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. The State standard will specify practice requirements for site specifications. Specifications will include, but are not limited to, recommended species, seeding rates and dates, establishment methods, nutrients needed, and other establishment information. Specifications can be recorded in narrative format, on job sheets, or forms designed to provide specific requirements for the practice.

OPERATION AND MAINTENANCE

Manage the cover crop to reduce competition from volunteer plants and shading.

Control weeds in the cover crop by mowing or herbicide application.

Cover crop residue will be maintained on the soil surface until within approximately 30 days of planting the following crop.

Cover crop residue will be retained on the soil surface, partially incorporated into the soil, or incorporated into the soil.

Table 1 – Annual Cool Season Grasses for Cover Crop

Species	PLS ^{1/} Seeding Rate (lb./acre)	Seeding Dates ^{2/}			Planting Depth (in.)
		Mountain- Limestone	Southern Piedmont	South Georgia	
Barley (<i>Hordeum vulgare</i>)	48 - 96	9/1 - 11/1	9/15 - 11/15	10/1 - 12/1	$\frac{3}{4}$ - 1 $\frac{1}{2}$
Oats (<i>Avena sativa</i>)	64 - 96	9/1 - 11/1	9/15 - 11/15	9/15 - 11/15	$\frac{3}{4}$ - 1 $\frac{1}{2}$
Rye (<i>Secale cereale</i>)	56 - 112	8/15 - 11/1	9/15 - 12/1	10/1 - 1/1	$\frac{3}{4}$ - 1 $\frac{1}{2}$
Triticale (<i>Triticum secale</i>)	48 - 96	-	-	10/15-12/15	$\frac{3}{4}$ - 1 $\frac{1}{2}$
Wheat (<i>Triticum aestivum</i>)	60 - 120	9/15 - 12/1	10/1 - 12/15	10/15 - 1/1	$\frac{3}{4}$ - 1 $\frac{1}{2}$

Table 2 – Annual Warm Season Grasses and Non-Legume Broadleaf Plants for Cover Crop

Species	PLS ^{1/} Seeding Rate (lb./acre)	Seeding Dates ^{2/}			Planting Depth (in.)
		Mountain- Limestone	Southern Piedmont	South Georgia	
Buckwheat (<i>Fagopyrum esculentum</i>)	50 - 70	5/15 - 7/15	5/1 - 8/1	4/15 - 8/15	$\frac{1}{2}$ - 1 $\frac{1}{2}$
Millet, Browntop (<i>Panicum ramosum</i>)	20 - 25	5/15 - 7/15	5/1 - 8/1	4/1 - 8/15	$\frac{1}{2}$ - 1
Millet, Pearl (<i>Pennisetum glaucum</i>)	20 - 25	5/1 - 7/15	4/15 - 7/15	4/1 - 7/15	$\frac{1}{2}$ - 1 $\frac{1}{2}$
Sorghum-Sudan Hybrids and Sudangrass (<i>Sorghum bicolor</i>)	20 - 25	5/1 - 7/15	4/15 - 8/1	4/1 - 8/15	$\frac{3}{4}$ - 1 $\frac{1}{2}$

Table 3 – Annual Cool Season Legumes for Cover Crop

Species	PLS^{1/} Seeding Rate (lb./acre)	Seeding Dates^{2/}			Planting Depth (in.)
		Mountain- Limestone	Southern Piedmont	South Georgia	
Clover, Arrowleaf (Amclo, Meechee, Yuchi) (<i>Trifolium vesiculosum</i>)	5 - 10	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	0 - ½
Clover, Ball (<i>Trifolium nigrescens</i>)	2 - 3	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	0 - ¼
Clover, Crimson (<i>Trifolium incarnatum</i>)	15 - 20	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	¼ - ½
Clover, Red (<i>Trifolium pratense</i>)	10 - 15	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	¼ - ½
Clover, Subterranean (<i>Trifolium subterraneum</i>)	10 - 20	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	¼ - ½
Pea, Austrian Winter (<i>Pisum sativum</i> subsp. <i>arvense</i>)	30 - 40	9/1 - 10/1	9/15 - 10/15	10/1 - 11/1	1 - 2
Vetch, Bigflower (<i>Vicia grandiflora</i>)	20 - 25	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	½ - 1
Vetch, Cahaba White (<i>Vicia sativa</i> X <i>V. cordata</i>)	15 - 20	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	¾ - 1 ½
Vetch, Common (<i>Vicia sativa</i>)	30 - 40	-	-	10/1 - 11/15	½ - 1
Vetch, Hairy (<i>Vicia villosa</i>)	20 - 25	9/1 - 10/15	9/15 - 11/1	10/1 - 11/15	½ - 1

Table 4 – Annual Warm Season Legumes for Cover Crop

Species	PLS^{1/} Seeding Rate (lb./acre)	Seeding Dates^{2/}			Planting Depth (in.)
		Mountain- Limestone	Southern Piedmont	South Georgia	
Cowpeas (<i>Vigna unguiculata</i>)	100 - 120	5/14 - 6/15	5/1 - 6/1	4/15 - 5/15	1 - 3
Lespedeza, Annual-					
Korean (<i>Kummerowia stipulacea</i>)	25 - 35	3/1 - 4/1	2/15 - 3/15	2/1 - 3/1	¼ - ½
Striate (<i>Kummerowia striata</i>)	25 - 35	3/1 - 4/1	2/15 - 3/15	2/1 - 3/1	¼ - ½
Velvetbean (<i>Stizolobium deeringianum</i>)	30 - 40	-	-	3/15 - 4/15	1 – 3

^{1/}PLS represents Pure Live Seed. To calculate the PLS, multiply the purity times the germination rate. Then divide the recommended seeding rate by the PLS to get the actual seeding rate.

For example, a bag of rye seed has a purity of 90% and germination of 85%.

Step 1: The PLS = $0.90 \times 0.85 = 0.77$. (In other words, only 77% of the material in the sack are seed that will germinate.)

Step 2: Divide the recommended seeding rate of 60 pounds by 0.77 and get the actual seeding rate of 78 pounds. You will need to plant 78 pounds of the rye seed per acre in order to be planting 60 pounds of pure live seed.

^{2/} Mountain-Limestone represents the **Blue Ridge, Sand Mountain,** and **Southern Appalachian Ridges and Valleys** Major Land Resource Areas (MLRA)

Piedmont represents the **Southern Piedmont** MLRA

South Georgia represents the **Southern Coastal Plain, Sand Hills,** and **Atlantic Coast Flatwoods** MLRAs

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